Connor Bridge
Structure #58N4590E0150002
Northeast of Fairland
Ottawa County
Oklahoma

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

Oklahoma State Historic Preservation Office
Oklahoma Historical Society
Oklahoma History Center, 800 Nazih Zuhdi Dr.
Oklahoma City, Oklahoma 73105

DOCUMENTATION
BRIDGE #58N4590E0150002

I. INTRODUCTION

Location:	Spans the Neosho River on section line road NS-459 approximately 3 miles northeast of Fairland. (Township 27N, Range 23E, on the section line between sections 26 and 27). UTM: Zone 15, 4073860N, 337700E
Map Reference:	U.S.G.S. 7.5' series, *MIAMI SE, OKLA.* (1961, photorevised 1982)
Date of Construction:	1916, reconstructed ca. 1951
Present Use:	Non-extant
Significance:	The Connor Bridge over the Neosho River is significant because it exemplifies the development of the transportation system in Ottawa County, in particular transportation associated with this county's primary waterways.
Preparer:	Anna Marie Eddings, Historian/ Architectural Historian, Oklahoma Department of Transportation Cultural Resources Program, April 30, 2012

II. HISTORICAL SUMMARY

Rivers in Ottawa County have been important to its transportation and settlement history. The Neosho River enters the county southeast of Chetopa, Kansas, and flows southeasterly until it merges with the Spring River and meets the Ozark uplift, where it turns southwestward and becomes known as the Grand River. Although initially belonging to the Osage Indians, the Western Cherokees settled in this area after 1828. Later, the land east of the Neosho/Grand River became home to a number of smaller tribes, such as the Ottawa, Quapaw, Peoria, and Wyandotte. The Osage Trace, which followed the Neosho/Grand River Valley, became an interregional transportation artery traversed by the Osages and merchants trading with them. The Ottawa County portion of this route was also part of the Texas Road, so named for its use by travelers to Texas, particularly in the immediate pre-Civil War years. Cattle drovers also followed this path, referring to it as the Shawnee or Sedalia Trail. It was the primary route for cattle drives from Texas to railheads in Missouri and Kansas before the Chisholm trail assumed greater importance.[1]

During this era, a common method of crossing rivers was by ferry, usually a flatboat propelled by poles, steam engines, or cables. In Indian Territory, tribal governments licensed and regulated ferries, placing an annual tax on them and prohibiting other ferries from operating nearby. In the post-Civil War years, typical ferry passenger tolls were fifty cents for a wagon and team, ten cents for a horse and rider, and five cents for a person on foot. In the Ottawa County area, some well-known ferries on the Neosho/Grand River were the Moses Pooler ferry on the Texas Road (also known as the Military Road), and the Audrain Ferry on the western border of the Wyandotte Reservation. Although the coming of the railroad to Indian Territory in 1871-72 diminished the role of the Texas Road as an interregional route, it became more important for local traffic. The railroads also brought many non-Indians to the area, which meant that local traffic along the Texas Road and the side roads leading out from it was increasing. Because of this increase in population and traffic, there was the potential for ferries to be more profitable.[2]

Often, wealthy landholders who needed to transport their own goods would establish ferries. This appears to have been the case with Francis Marion (Frank) Connor. Although not an Indian himself, he married into a Cherokee family and built a home and farm on the south side of the Neosho River, opposite the Wyandotte Reservation, and engaged in large-scale ranching operations. In addition, Connor was active in the political affairs of the Cherokee Nation and he had business interests in the nearby town of Fairland. He set up a ferry over the Neosho River near his home. Run by Amos Berry and known as the Berry Ferry, it was approximately half a mile east of the future location of the Connor Bridge. This ferry was heavily used for travel to and from destinations such as Baxter Springs, Kansas, and Seneca, Missouri, which were the

nearest major trade centers for this region before towns began to grow in Indian Territory. Available maps indicate that this ferry was operational in 1897, but had closed by 1906. It is likely that an increase in road and bridge construction opened alternate routes and lessened the need for this ferry. For example, around 1900 the Miami Toll Bridge Company built a bridge over the Neosho River.[3]

The Connor Bridge resulted from the ongoing efforts toward transportation improvements in Ottawa County. As allotment of the Indians' land officially opened Indian Territory for settlement, the population continued to increase which, when combined with the founding and growth of towns, reinforced the need for constructing roads and bridges. Statehood in 1907 and the organization of county government provided the funding mechanisms instrumental in this construction. The Ottawa County Commissioners in 1909 were considering an election to approve the issuance of $120,000 worth of bonds for bridge construction, and in 1916 they advertised for bids on bridges over the Neosho, Grand, and Spring Rivers. Included in this group was a bridge at Connor's Crossing on the Neosho River. Plans and specifications for this and the other bridges were on file with the County Clerk. The Connor Bridge was designated as bridge #5, and it was to be steel, sixteen feet wide curb-to-curb, and 366 feet long, at an estimated cost of $11,000. At the County Commissioners' meeting on 4 March 1916, they opened the bids and awarded the contract for five bridges including the Connor Bridge to the Missouri Valley Bridge and Iron Company for $163,436. The bid for the Connor Bridge individually was $10,965. The Missouri Valley Bridge and Iron Company had a reputation for specializing in large bridges like these and the underwater pier foundations that they required.[4]

Flooding has been a problem along the rivers in Ottawa County. Serious floods occurred in 1926, 1927, 1941, 1943, and 1944. During the 1943 flood, the *Miami Daily News-Record* newspaper reported that a large drift had lodged against the Connor Bridge and it was in danger of collapse. However, research has revealed no further information about the effects of this flood on the bridge. But a more severe flood along the Neosho River occurred in 1951. Highways and railroad tracks leading into the county seat of Miami were flooded, telephone and electrical service was cut off, and the town experienced large-scale evacuation and property damage. As reported in the *Miami Daily News-Record* on 19 July 1951, this flood washed out the Connor Bridge and a railroad bridge in southeast Miami.[5]

Rebuilding bridges had long been challenging, requiring creative solutions. During World War II, rationing made construction material such as steel difficult to obtain, and shortages continued after the war. Steel was also rationed during the Korean conflict in 1950-1953. In October of 1951, the *Miami Daily News-Record* reported that steel rationed by an allotment system was leading to shortages and holding up bridge projects. While not referencing the Connor Bridge,

by noting the shortage of steel, this newspaper report gives some evidence that the Connor Bridge was possibly reconstructed using recycled steel. The bridge itself shows signs of reconstruction using through truss spans moved in from another location, although research has uncovered no record of exactly when or how this reconstruction would have taken place. Moving and reusing truss bridges was a common practice historically. The Oklahoma State Highway Commission report covering the years 1942-1944 pointed out that because of war-related shortages, damaged bridges were being rebuilt with used material. The widespread flooding in the Spring of 1943 was particularly hard on a number of bridges. For example, a large Parker through truss bridge over the Arkansas River near Webbers Falls, partially washed out by the 1943 flood, was repaired with one Pratt through and approximately four camelback through trusses from other locations. In Ottawa County, a Spring River bridge damaged in 1943 was repaired using trusses from the Twin Bridges area, where the Neosho and Spring Rivers merged with the Grand River. Here the impoundment of Grand Lake had necessitated new, larger bridges. Dam construction in the 1940s and 1950s was making a number of truss bridges obsolete at their original locations and available for reuse elsewhere. Rebuilding in this manner often resulted in joining different types of trusses that normally would not be seen together in an entirely original bridge.[6]

The Connor Bridge's unusual combination of trusses as well as other construction details point to its reconstruction. It consists of a 100-foot, five-panel Pratt through truss on the north end, a 130-foot, seven-panel Parker through truss in the center, and a 150-foot, eight-panel Parker through truss on the south end. Because the southernmost Parker extends beyond the south abutment by about seventeen feet while the northernmost Pratt rests directly on the north abutment, it appears likely that the Pratt is original and the Parker trusses were moved here. On top of the pier where the Pratt and the middle Parker meet, the Pratt sits on raised concrete blocks on top of the pier, while the Parker sits directly on top of the pier, giving the appearance that these trusses required adjustment to fit together properly. The Pratt-Parker combination of the Connor Bridge is similar in design to the Arkansas River Bridge at Ponca City in Kay County, which was reconstructed after a 1944 flood washed out most of its spans. This bridge at Ponca City was originally constructed in 1909 by the Missouri Valley Bridge and Iron Company, also builder of the Connor Bridge, utilizing Pratt through trusses. In its reconstruction, one Pratt remained and it was combined with three Parker through trusses from a bridge across the Red River that was eliminated by the creation of Lake Texoma.[7]

Aside from evidence of reconstruction, other engineering features of the Connor Bridge are noteworthy. As described above, it is a combination of one Pratt through truss and two Parker through trusses. The defining features of a Pratt truss are a top chord that is flat, while extending below this topmost beam are vertical beams that carry compressive (pushed together) forces and

diagonal beams that carry tensile (pulled apart) forces. A Parker truss, likewise, has verticals in compression and diagonals in tension, but its top chord is curved, or polygonal, rather than flat. Because a truss bridge's stresses are greater at mid-span than at the ends, a curved top chord allows for more depth (that is, taller verticals and diagonals) at the center of the truss where stresses are highest, and less depth (that is, shorter verticals and diagonals) at the ends of the truss where the stresses are lighter and the extra metal is not needed. Thus polygonal top chord-bridges brought about a reduction in weight compared to flat top chord-bridges, which made the curved top chord-design favorable for longer spans.[8] Accordingly, the Connor Bridge's Parker spans are longer than its Pratt span. All spans have pinned connections and the bridge deck is fifteen feet wide, indicative of lightweight construction. These details are characteristic of bridges built before the proliferation of automobiles which required heavier, wider bridges. These details are also typical of bridges built before the widespread adoption of the standard designs produced by state highway department engineers in Oklahoma. Large bridges like the Connor Bridge are more important than average because they embody greater technical achievement and a significant commitment of funds, which is a measure of their importance to the local community.

III. DESCRIPTION

The Connor Bridge is made up of one Pratt through truss and two Parker through trusses. The entire bridge is 380 feet long, with a deck width of 15 feet and a total width of 16 feet. In describing metal truss bridges, a through truss is a truss bridge that has lateral bracing and struts over the top of the roadway. The topmost beam of the truss is called the top chord, the bottom beam is called the bottom chord, and linking the top and bottom chords are vertical and diagonal beams. A panel refers to the area between any two vertical beams, and the area between a vertical and the inclined end post at the end of the truss.

The Pratt truss is the northernmost span, and it is five panels and 100 feet long. The middle Parker truss is seven panels and 130 feet long, while the southernmost Parker truss is eight panels and 150 feet long. The bridge has a timber deck, and pinned connections. Following is a description of the truss members:

Top Chord: Pair of C-beams with a riveted top plate and zig-zag lacing on bottom
Inclined End Posts: Same as the top chord
Bottom Chord: Pair of eye-bars
Diagonals: Paired and single eye-bars
Verticals: Pair of C-beams with zig-zag lacing, except end verticals which are single pair of L-beams connected by batten plates on the Pratt, and two pair of L-beams connected by batten plates on the Parkers

By their size and makeup, the truss members themselves demonstrate how they function. The bottom chords and diagonals are thin eye-bars because they carry tensile forces. The top chords, inclined end posts, and verticals are heavier, built-up beams because they carry compressive forces. However, the end verticals , unlike the other verticals, carry tensile forces and so they are not as heavily-built.

Underneath the timber deck, there are I-beam stringers running longitudinally the length of the trusses, with the exception of the stringers on the outer edges which are C-beams. Larger I-beam floor beams span the width of the trusses. The floor beams are connected to the verticals below the bottom chords. Bottom lateral bracing consists of rods in an "X" pattern between the floor beams.

The north abutment is concrete and sits on the river bank, while the south abutment (also concrete) is shorter and rests on the limestone bedrock of the south bank. A bridge's wing walls are designed to extend out from the front wall of the abutment to retain roadway fill. The north wing walls come straight out from the abutment at a ninety-degree angle, while the south wing walls extend back behind the abutment parallel to the road. As they continue south, they widen and form an acute angle with the road. As described above, the end of the south Parker through truss reaches beyond the south abutment about seventeen feet, which is unusual and provides some evidence that this Parker truss is not original. The concrete bridge piers are constructed of columns with solid web wall in between, and are pointed on both upstream and downstream ends. The trusses rest on plate bearings on the tops of the piers. As noted above, the Pratt truss and its bearings sit on raised concrete blocks on top of the pier, while the adjoining Parker and its bearings sit directly on the pier.

Characteristic of through trusses, both the Pratt and the Parker spans have top struts, and top lateral bracing in an "X" pattern between these struts. On the Parker spans, the sway bracing below the struts takes the pattern of an "X" with an added vertical bar. The Pratt span has no sway bracing. The portal bracing on all spans is a row of four "X"s, and there are diagonal portal brackets.

Under a Memorandum of Agreement with the Oklahoma State Historic Preservation Office, the Connor Bridge is being replaced with a modern two-lane bridge. Before demolition, the middle Parker span had a badly bent northeast hip vertical, and its southeast inclined end post has sections of riveted plates to repair cracks/breaks. The piers had minor cracking. The bridge had already experienced some flood damage and was closed to traffic.

IV ENDNOTES

1. Brad A. Bays, *Townsite Settlement and Dispossession in the Cherokee Nation, 1866-1907* (New York, NY: Garland Publishing, 1998), 19; Larry O'Dell, "Ottawa County," *Encyclopedia of Oklahoma History and Culture*, http://digital.library.okstate.edu/ encyclopedia (accessed September 29, 2008); William Paul Corbett, "Oklahoma's Highways: Indian Trails to Urban Expressways," (Ph.D. dissertation, Oklahoma State University, 1982), 12, 99-101; Bobby D. Weaver, "Texas Road," *Encyclopedia of Oklahoma History and Culture*, http://digital.library.okstate.edu/encyclopedia (accessed September 27, 2010); Charles Robert Goins and Danney Goble, *Historical Atlas of Oklahoma*, 4th ed. (Norman, OK: University of Oklahoma Press, 2006), 109-10, 116-17.

2. Larry O'Dell, "Ferries and Fords," *Encyclopedia of Oklahoma History and Culture*, http://digital.library.okstate.edu/encyclopedia (accessed June 30, 2009); Corbett, "Oklahoma's Highways," 142, 150; Indian-Pioneer Papers Collection, vol. 43, p. 333, Western History Collections, University of Oklahoma, Norman, Oklahoma; Weaver, "Texas Road"; Chester M. Davis, *Railroads of Oklahoma* (n. p.: State of Oklahoma Department of Transportation Survey Division, 1978), 52, 69, 79; Ohland Morton, "Reconstruction in the Creek Nation," *Chronicles of Oklahoma* 9 (June 1931), 174.

3. O'Dell, "Ferries and Fords"; Indian-Pioneer Papers Collection, vol. 20, p. 127, vol. 93,pp. 255, 259, vol. 43, pp. 332-33, 340, vol. 59, pp. 375-76, Western History Collections; Velma Nieberding, *The History of Ottawa County* (Miami, OK: Walsworth Publishing Company, 1983), 527; General Land Office (GLO) Map for Township 27 North, Range 23 East, 1898; U.S.G.S. Quadrangle, *Wyandotte, Okla.-Mo.*, 1907; Risdon Moore O'Dell, *A Pen Picture of Miami, Indian Territory, and Tributary Lands* ([Miami, OK]: Press of the Miami Republican, November 1902, in "Miami" Vertical File, Research Division, Oklahoma Historical Society, Oklahoma City, Oklahoma, 31.

4. Clara Sue Kidwell, "Allotment," *Encyclopedia of Oklahoma History and Culture*, http://digital.library.okstate.edu/encyclopedia (accessed October 21, 2010); Bays, *Townsite Settlement*, 10; Edward Everett Dale, *Oklahoma: The Story of a State* (Evanston, IL: Row, Peterson and Company, 1949), 293, 295; Nieberding, *History*, 112; Works Progress Administration, Minutes of the Boards of County Commissioners, Ottawa County, box 24, folder 8, 18 February, 4 March 1916, in WPA Collection, Oklahoma State Archives, Oklahoma Department of Libraries, Oklahoma City, Oklahoma; Larry Jochims, "Metal Truss Bridges in Kansas, 1861-1939," National Register of Historic Places, Multiple Property Documentation Form (On file at the Kansas State Historic Preservation Office, Topeka, Kansas, 1990), section E, page 3; Joseph E. King, *Spans of Time: Oklahoma Historic Highway Bridges* (Oklahoma

City, OK: Oklahoma Department of Transportation Planning Division, 1993), 19.

5. House Committee on Public Works, *Grand (Neosho) River and Its Tributaries, Oklahoma, Kansas, Missouri, and Arkansas*, 80th Congress, 2nd Session, July 22, 1947 (Washington, D.C.: United States Government Printing Office, 1948), 3, 20; *Miami Daily News-Record*, 20 May 1943, 19 July 1951; Nieberding, *History*, 193-94; Don-El A. Steiger, "The Urban Geography of Ottawa County, Oklahoma," (Masters thesis, University of Oklahoma, 1960), 70.

6. King, *Spans*, 27, 32, 60; FRASERdesign, *Missouri Historic Bridge Inventory: Draft Inventory Report,* vol. 1 (n. p.: Missouri Highway and Transportation Department, April 1996), 32; Lichtenstein Consulting Engineers, *Historic Bridge Inventory Update: Historic Contexts* (n.p.: Georgia Department of Transportation, June 2001), 61; *Miami Daily News-Record*, 5 October 1951, 10 February 1980; *Biennial Report of the State Highway Commission of Oklahoma, 1942-1944* (Oklahoma City, Oklahoma. December 1, 1944), 12, 98-99, 101.

7. Anna Eddings, "Arkansas River Mixed Truss, Structure #36E0220N334000," unpublished document, Oklahoma Department of Transportation Cultural Resources Program, Norman, Oklahoma.

8. FRASERdesign, *Missouri Historic Bridge Inventory,* 102; James L. Cooper, *Iron Monuments to Distant Posterity: Indiana's Metal Bridges,1870-1930* (n.p.: DePauw University, Federal Highway Administration, Indiana Department of Highways, Indiana Department of Natural Resources, National Park Service, 1987), 70; Jochims, "Metal Truss Bridges in Kansas," section E, page 2.

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LIST OF PHOTOGRAPHS

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16. Detail of Parker vertical, looking NE
17. Pratt span, looking N
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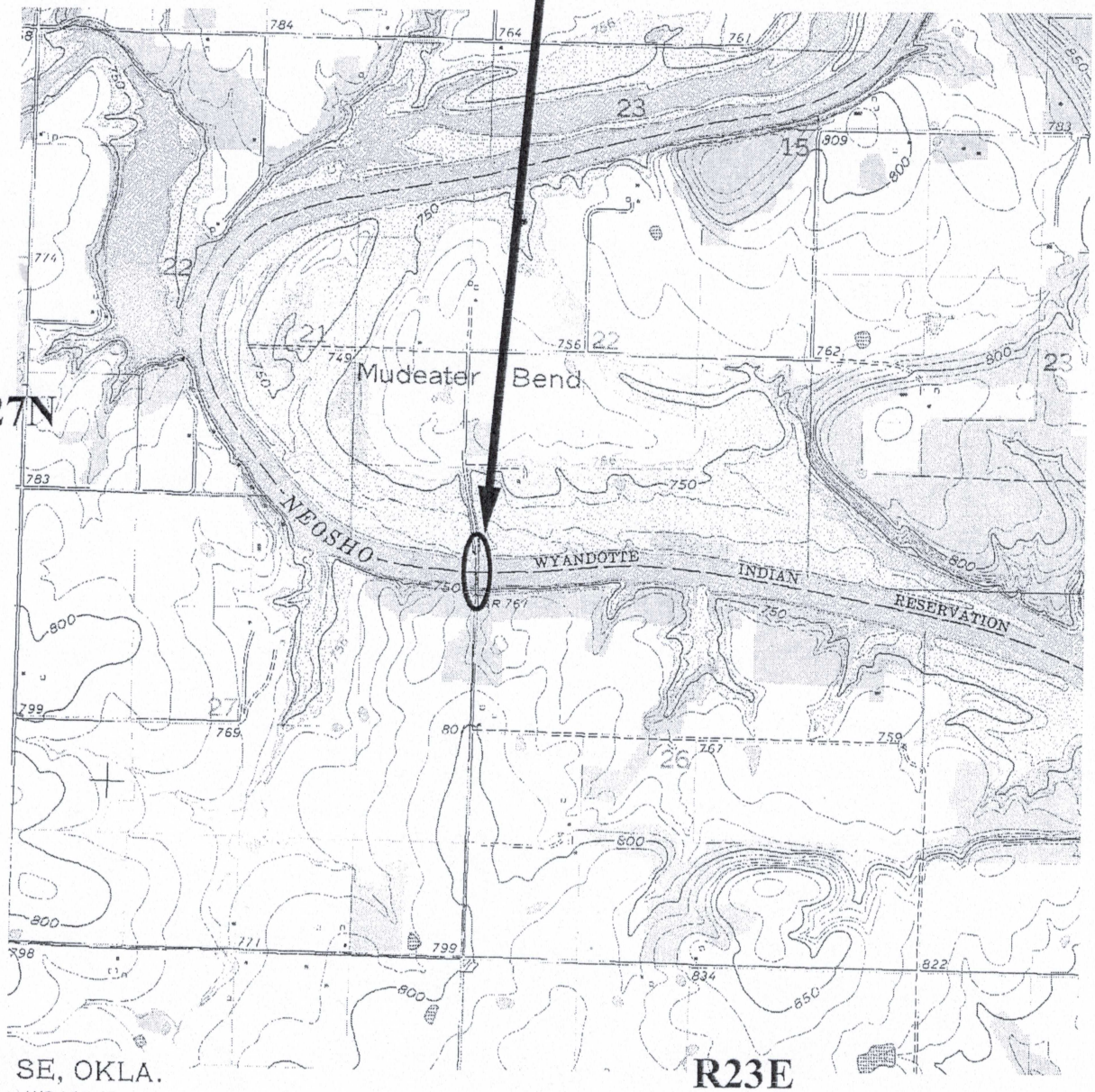
Structure #58N4590E0150002



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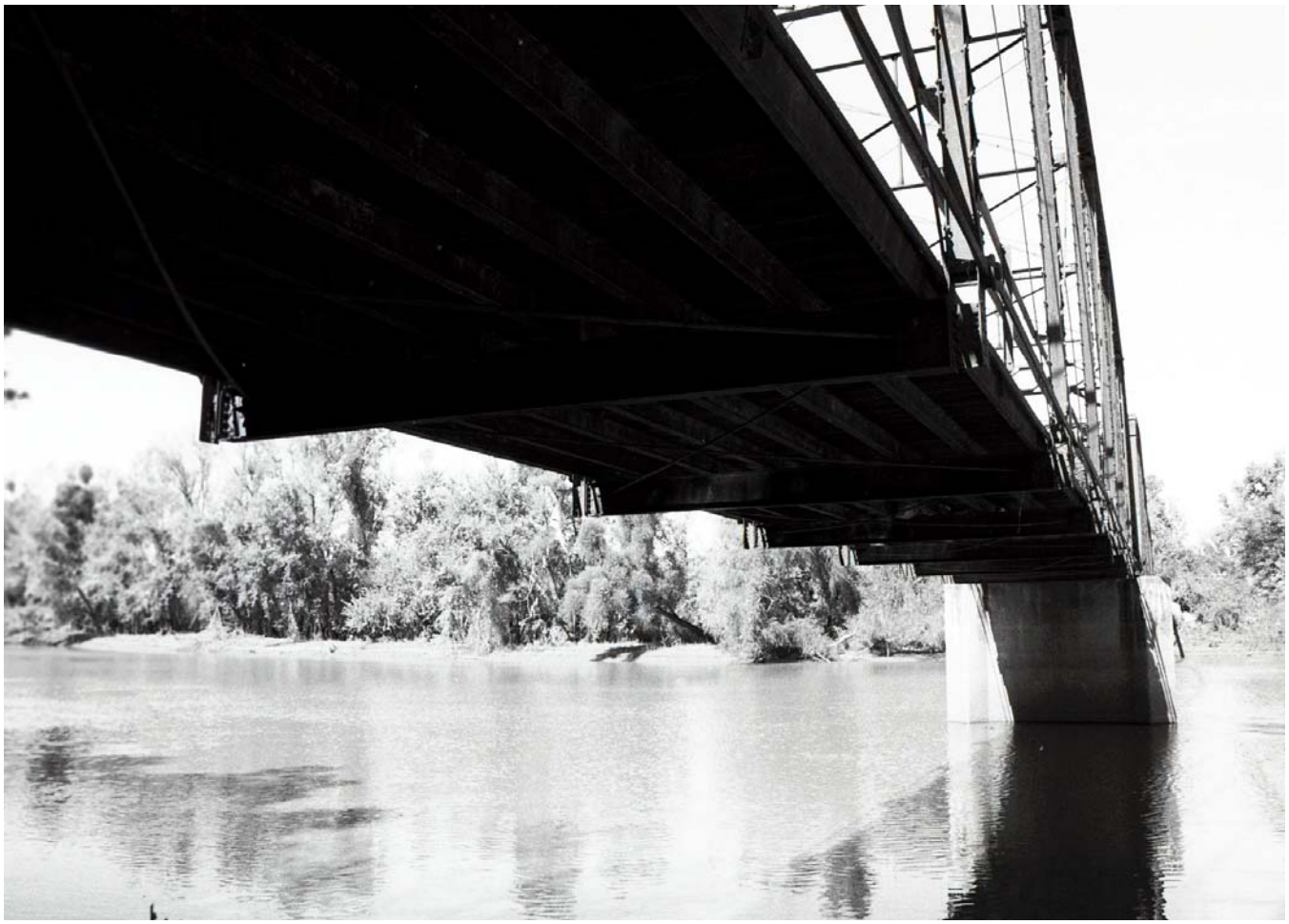


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